

<sup>74</sup>Ge( $\gamma,\gamma'$ ),(pol  $\gamma,\gamma'$ ) 1995Ju01,1970Mo32

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Ameenah R. Farhan		NDS 107, 1923 (2006)	30-Apr-2006

1995Ju01: ( $\gamma,\gamma'$ ) E=4, 10 MeV bremsstrahlung. (pol  $\gamma,\gamma'$ ) E=9-14 MeV bremsstrahlung, highly-enriched targets. Measured  $E\gamma,\gamma\gamma(\theta),\gamma(\text{pol}),I\gamma$ , analyzing powers. Deduced widths and transition probabilities.

1970Mo32 (also 1979Mo19,1971Mo26,1970Mo26): ( $\gamma,\gamma'$ ) Natural target. Measured  $\gamma\gamma(\theta),\gamma(\text{pol})$  with Compton polarimeter.

Others: 1959Ze12, 1956Me13.

All data are from 1995Ju01, unless otherwise stated.

<sup>74</sup>Ge Levels

Comparative values of  $\Gamma^2/\Gamma$  listed at 10 MeV for levels between 2690 and 3875 are not corrected for a substantial feeding from higher-lying states.

E(level)	J $\pi^{\ddagger}$	T <sub>1/2</sub> or $\Gamma$	I <sub>s</sub> (eVb) <sup>†</sup>	Comments
0.0	0 <sup>+</sup>			
596.2 24	2 <sup>+</sup>	13 ps 2		T <sub>1/2</sub> from 1956Me13.
1205.5 25	2 <sup>+</sup>			
1486 4	0 <sup>+</sup>			
1718? 3				
2198 3	2 <sup>+</sup>			
2227 3	0 <sup>+</sup>			
2403.5# @ 4	1#	0.0004 eV 1	0.4 1	$\Gamma_0^2/\Gamma=0.0004$ eV 1. B(M1)=0.01, B(E1)=0.11×10 <sup>-5</sup> .
2599 4	(1,2,3) <sup>+</sup>			
2690.6# @ 3	1#	0.0015 eV 3	2.1 3	$\Gamma_0^2/\Gamma=0.0015$ eV 3 at 4 MeV, 0.071 eV 18 at 10 MeV. B(M1)=0.02, B(E1)=0.22×10 <sup>-5</sup> .
3001 4	2 <sup>+</sup>			
3032.8# 2	1#	0.0112 eV 6	11.7 5	$\Gamma_0^2/\Gamma=0.0093$ eV 4 at 4 MeV, 0.071 eV 10 at 10 MeV. B(M1)=0.10, B(E1)=1.1×10 <sup>-5</sup> .
3092.2# 2	1 <sup>(+)</sup> #	0.0104 eV 11	6.8 5	$\Gamma_0^2/\Gamma=0.0056$ eV 4 at 4 MeV, 0.069 eV 16 at 10 MeV. B(M1)=0.09 1.
3276.3# @ 2	1#	0.0013 eV 4	1.4 4	$\Gamma_0^2/\Gamma=0.0013$ eV 4. B(M1)=0.01, B(E1)=0.11×10 <sup>-5</sup> .
3557.9# 3	1 <sup>(-)</sup> #	0.050 eV 8	30.6 44	$\Gamma_0^2/\Gamma=0.034$ eV 5 at 4 MeV, 0.074 eV 16 at 10 MeV. B(E1)=3.2×10 <sup>-5</sup> 5.
3647.9# @ 7	1+#	0.028 eV 6	24.6 55	$\Gamma_0^2/\Gamma=0.028$ eV 6 at 4 MeV, 0.045 eV 9 at 10 MeV. B(M1)=0.15 3.
3874.9# @ 3	1+#	0.099 eV 18	76 14	$\Gamma_0^2/\Gamma=0.099$ eV 18 at 4 MeV, 0.136 eV 8 at 10 MeV. B(M1)=0.44 8.
4006.8 @ & 4	1 &	0.044 eV 6	31.6 46	$\Gamma_0^2/\Gamma=0.044$ eV 6.
4084.9 @ & 5	1+ &	0.060 eV 8	41 5	$\Gamma_0^2/\Gamma=0.060$ eV 8, B(M1)=0.23 3.
4171.5 & c 3	1 &		49 7	$\Gamma_0^2/\Gamma<0.074$ eV.
4224.9 @ & 8	1- &	0.090 eV 10	58 6	$\Gamma_0^2/\Gamma=0.090$ eV 10, B(E1)=3.4×10 <sup>-5</sup> 4.
4305.8 @ & 13	1 &	0.047 eV 7	29 4	$\Gamma_0^2/\Gamma=0.047$ eV 7.
4342.6 & c 3	1 &		35 9	$\Gamma_0^2/\Gamma<0.057$ eV.
5434.8 & a 5	1- &	0.40 eV 3	104 8	$\Gamma_0^2/\Gamma=0.267$ eV 22, B(E1)=7.1×10 <sup>-5</sup> 6.
5485.1 @ & 12	1 &	0.075 eV 11	29 4	$\Gamma_0^2/\Gamma=0.075$ eV 11.
5493.1 @ & 10	1 &	0.087 eV 17	33 7	$\Gamma_0^2/\Gamma=0.087$ eV 17.
5514.8 & a 8	1 &	0.23 eV 4	34 6	$\Gamma_0^2/\Gamma=0.091$ eV 16.
5743.7 @ & 10	1 &	0.110 eV 13	38 5	$\Gamma_0^2/\Gamma=0.110$ eV 13.
5766.7 @ & 4	1 <sup>(+)</sup> &	0.167 eV 26	58 9	$\Gamma_0^2/\Gamma=0.167$ eV 26, B(M1)=0.23 4.

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<sup>74</sup>Ge( $\gamma,\gamma'$ ),(pol  $\gamma,\gamma'$ ) **1995Ju01,1970Mo32** (continued)

<sup>74</sup>Ge Levels (continued)

E(level)	J <sup><math>\pi</math></sup> <sup>‡</sup>	T <sub>1/2</sub> or $\Gamma$	I <sub>s</sub> (eVb) <sup>†</sup>	Comments
6017.4 24	1 <sup>-</sup>			$\Gamma=0.120$ eV 15 (1970Mo26). E(level): level not reported by 1995Ju01.
6445.1 &a 11	1 &	0.39 eV 11	34 10	$\Gamma_0^2/\Gamma=0.121$ eV 35.
6477.9 @ & 6	1 <sup>-</sup> &	0.226 eV 21	62 6	$\Gamma_0^2/\Gamma=0.226$ eV 2, B(E1)= $2.4\times 10^{-5}$ 2.
6650.3 &a 3	1 <sup>-</sup> &	0.92 eV 7	70 5	$\Gamma_0^2/\Gamma=0.270$ eV 20, B(E1)= $8.9\times 10^{-5}$ 7.
6660.5 @ & 5	1 <sup>-</sup> &	0.337 eV 20	88 5	$\Gamma_0^2/\Gamma=0.337$ eV 20, B(E1)= $3.3\times 10^{-5}$ 2.
6732.7 @ & 8	1 <sup>+</sup> &	0.29 eV 3	73 9	$\Gamma_0^2/\Gamma=0.29$ eV 3, B(M1)=0.25 3.
6942.6 @ & 6	1 <sup>-</sup> &	0.35 eV 3	84 7	$\Gamma_0^2/\Gamma=0.35$ eV 3, B(E1)= $3.0\times 10^{-5}$ 2.
7150.8 &a 16	1 <sup>-</sup> &	0.58 eV 9	77 13	$\Gamma_0^2/\Gamma=0.34$ eV 6, B(E1)= $4.5\times 10^{-5}$ 7.
7264.6 @ & 6	1 <sup>-</sup> &	0.81 eV 3	177 8	$\Gamma_0^2/\Gamma=0.81$ eV 3, B(E1)= $6.1\times 10^{-5}$ 3.
7379.9 @ & 10	1 &	0.25 eV 4	53 8	$\Gamma_0^2/\Gamma=0.25$ eV 4.
7445.3 &b 11	1 &		44 7	$\Gamma_0^2/\Gamma=0.21$ eV 3.
7506.7 @ & 10	1 <sup>(-)</sup> &	0.40 eV 3	82 7	$\Gamma_0^2/\Gamma=0.40$ eV 3, B(E1)= $2.7\times 10^{-5}$ 2.
7550.7 &a 7	1 <sup>-</sup> &	0.80 eV 11	102 14	$\Gamma_0^2/\Gamma=0.51$ eV 7, B(E1)= $5.3\times 10^{-5}$ 7.
7616.0 &b 8	1 &		50 7	$\Gamma_0^2/\Gamma=0.25$ eV 3.
7652.1 &a 6	1 <sup>-</sup> &	1.51 eV 12	84 7	$\Gamma_0^2/\Gamma=0.43$ eV 3, B(E1)= $9.6\times 10^{-5}$ 8.
8219.0 @ & 8	1 &	0.36 eV 5	61 8	$\Gamma_0^2/\Gamma=0.36$ eV 5.
8250.2 @ & 8	1 &	0.33 eV 8	55.0 13	$\Gamma_0^2/\Gamma=0.33$ eV 8.
8361.1 &a 12	1 &	0.88 eV 18	59.9 12	$\Gamma_0^2/\Gamma=0.36$ eV 7.

<sup>†</sup> Integrated cross section.

<sup>‡</sup> From  $\gamma\gamma(\theta)$  and/or  $\gamma(\text{pol})$  for levels above 2400, below this energy assignments are from 'Adopted Levels'.

# From ( $\gamma,\gamma'$ ) (1995Ju01).

@ No inelastic transition (to excited states) observed (1995Ju01).

& From (pol  $\gamma,\gamma'$ ) (1995Ju01).

<sup>a</sup> (Unspecified) branching to other states observed.

<sup>b</sup> Feeding of this level is ambiguous.

<sup>c</sup> Level populated by inelastic transitions.

$\gamma(^{74}\text{Ge})$

E <sub>i</sub> (level)	J <sup><math>\pi</math></sup> <sub>i</sub>	E <sub><math>\gamma</math></sub>	E <sub>f</sub>	J <sup><math>\pi</math></sup> <sub>f</sub>	Mult.	Comments
596.2	2 <sup>+</sup>	596 4	0.0	0 <sup>+</sup>	E2	Mult.: from $\gamma(\text{pol},\theta)$ (1959Ze12). A <sub>2</sub> =+0.37 7, A <sub>4</sub> =+1.06 9 in $\gamma\gamma(\theta)$ .
1205.5	2 <sup>+</sup>	609 4	596.2	2 <sup>+</sup>		
		1206 4	0.0	0 <sup>+</sup>		
1486	0 <sup>+</sup>	890 4	596.2	2 <sup>+</sup>		
1718?		1719 <sup>‡</sup> 4	0.0	0 <sup>+</sup>		
2198	2 <sup>+</sup>	994 4	1205.5	2 <sup>+</sup>		
		1601 4	596.2	2 <sup>+</sup>		
		2197 4	0.0	0 <sup>+</sup>		
2227	0 <sup>+</sup>	1020 4	1205.5	2 <sup>+</sup>		
		1631 4	596.2	2 <sup>+</sup>		
2403.5	1	2403.5 4	0.0	0 <sup>+</sup>		
2599	(1,2,3) <sup>+</sup>	2002 4	596.2	2 <sup>+</sup>		
2690.6	1	2690.6 3	0.0	0 <sup>+</sup>		
3001	2 <sup>+</sup>	774 4	2227	0 <sup>+</sup>		

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$^{74}\text{Ge}(\gamma,\gamma'),(\text{pol } \gamma,\gamma')$  **1995Ju01,1970Mo32** (continued) $\gamma(^{74}\text{Ge})$  (continued)

$E_i(\text{level})$	$J_i^\pi$	$E_\gamma$	$I_\gamma^\dagger$	$E_f$	$J_f^\pi$	Mult.	Comments
3001	2 <sup>+</sup>	2404 <sup>‡</sup> 4		596.2	2 <sup>+</sup>		
3032.8	1	1828.6		1205.5	2 <sup>+</sup>		
		3032.8 2		0.0	0 <sup>+</sup>		
3092.2	1 <sup>(+)</sup>	1888.0		1205.5	2 <sup>+</sup>		
		3092.2 2		0.0	0 <sup>+</sup>		
3276.3	1	3276.3 2		0.0	0 <sup>+</sup>		
3557.9	1 <sup>(-)</sup>	2962.1		596.2	2 <sup>+</sup>		
		3557.9 3		0.0	0 <sup>+</sup>		
3647.9	1 <sup>+</sup>	3647.9 7		0.0	0 <sup>+</sup>		
3874.9	1 <sup>+</sup>	3874.9 3		0.0	0 <sup>+</sup>		
4006.8	1	4006.8 4		0.0	0 <sup>+</sup>		
4084.9	1 <sup>+</sup>	4084.9 5		0.0	0 <sup>+</sup>		
4171.5	1	4171.5 3		0.0	0 <sup>+</sup>		
4224.9	1 <sup>-</sup>	4224.9 8		0.0	0 <sup>+</sup>		
4305.8	1	4305.8 13		0.0	0 <sup>+</sup>		
4342.6	1	4342.6 3		0.0	0 <sup>+</sup>		
5434.8	1 <sup>-</sup>	5434.8 5		0.0	0 <sup>+</sup>		
5485.1	1	5485.1 12		0.0	0 <sup>+</sup>		
5493.1	1	5493.1 10		0.0	0 <sup>+</sup>		
5514.8	1	5514.8 8		0.0	0 <sup>+</sup>		
5743.7	1	5743.7 10		0.0	0 <sup>+</sup>		
5766.7	1 <sup>(+)</sup>	5766.7 4		0.0	0 <sup>+</sup>		
6017.4	1 <sup>-</sup>	3017 4	2 1	3001	2 <sup>+</sup>		
		3418 4	1.0 5	2599	(1,2,3) <sup>+</sup>		
		3789 4	4 1	2227	0 <sup>+</sup>		$A_2=+0.51$ 10, $\Gamma=0.005$ eV.
		3818 4	9 1	2198	2 <sup>+</sup>		$A_2=+0.14$ 4, $\delta=0.13$ 11, $\Gamma=0.011$ eV, $\Gamma(\text{M2})=0.00019$ eV.
		4301 <sup>‡</sup> 4		1718?			
		4532 4	6 1	1486	0 <sup>+</sup>		$A_2=+0.51$ 8, $\Gamma=0.007$ eV.
		4812 4	16 2	1205.5	2 <sup>+</sup>		$A_2=+0.04$ 3, $\delta=0.014$ +42-14, $\Gamma=0.019$ eV.
		5422 4	41 4	596.2	2 <sup>+</sup>	E1	$A_2=+0.044$ 10, $\delta=0.01$ 1, $\Gamma=0.049$ eV, $\text{pol}=+0.98$ 2.
		6018 4	19 2	0.0	0 <sup>+</sup>	E1	$A_2=+0.51$ 2, $\Gamma=0.023$ eV, $\text{pol}=+0.88$ 4.
6445.1	1	6445.1 11		0.0	0 <sup>+</sup>		
6477.9	1 <sup>-</sup>	6477.9 6		0.0	0 <sup>+</sup>		
6650.3	1 <sup>-</sup>	6650.3 3		0.0	0 <sup>+</sup>		
6660.5	1 <sup>-</sup>	6660.5 5		0.0	0 <sup>+</sup>		
6732.7	1 <sup>+</sup>	6732.7 8		0.0	0 <sup>+</sup>		
6942.6	1 <sup>-</sup>	6942.6 6		0.0	0 <sup>+</sup>		
7150.8	1 <sup>-</sup>	7150.8 16		0.0	0 <sup>+</sup>		
7264.6	1 <sup>-</sup>	7264.6 6		0.0	0 <sup>+</sup>		
7379.9	1	7379.9 10		0.0	0 <sup>+</sup>		
7445.3	1	7445.3 11		0.0	0 <sup>+</sup>		
7506.7	1 <sup>(-)</sup>	7506.7 10		0.0	0 <sup>+</sup>		
7550.7	1 <sup>-</sup>	7550.7 7		0.0	0 <sup>+</sup>		
7616.0	1	7616.0 8		0.0	0 <sup>+</sup>		
7652.1	1 <sup>-</sup>	7652.1 6		0.0	0 <sup>+</sup>		
8219.0	1	8219.0 8		0.0	0 <sup>+</sup>		
8250.2	1	8250.2 8		0.0	0 <sup>+</sup>		
8361.1	1	8361.1 12		0.0	0 <sup>+</sup>		

<sup>†</sup> Percent photon branching.

<sup>‡</sup> Placement of transition in the level scheme is uncertain.

<sup>x</sup>  $\gamma$  ray not placed in level scheme.

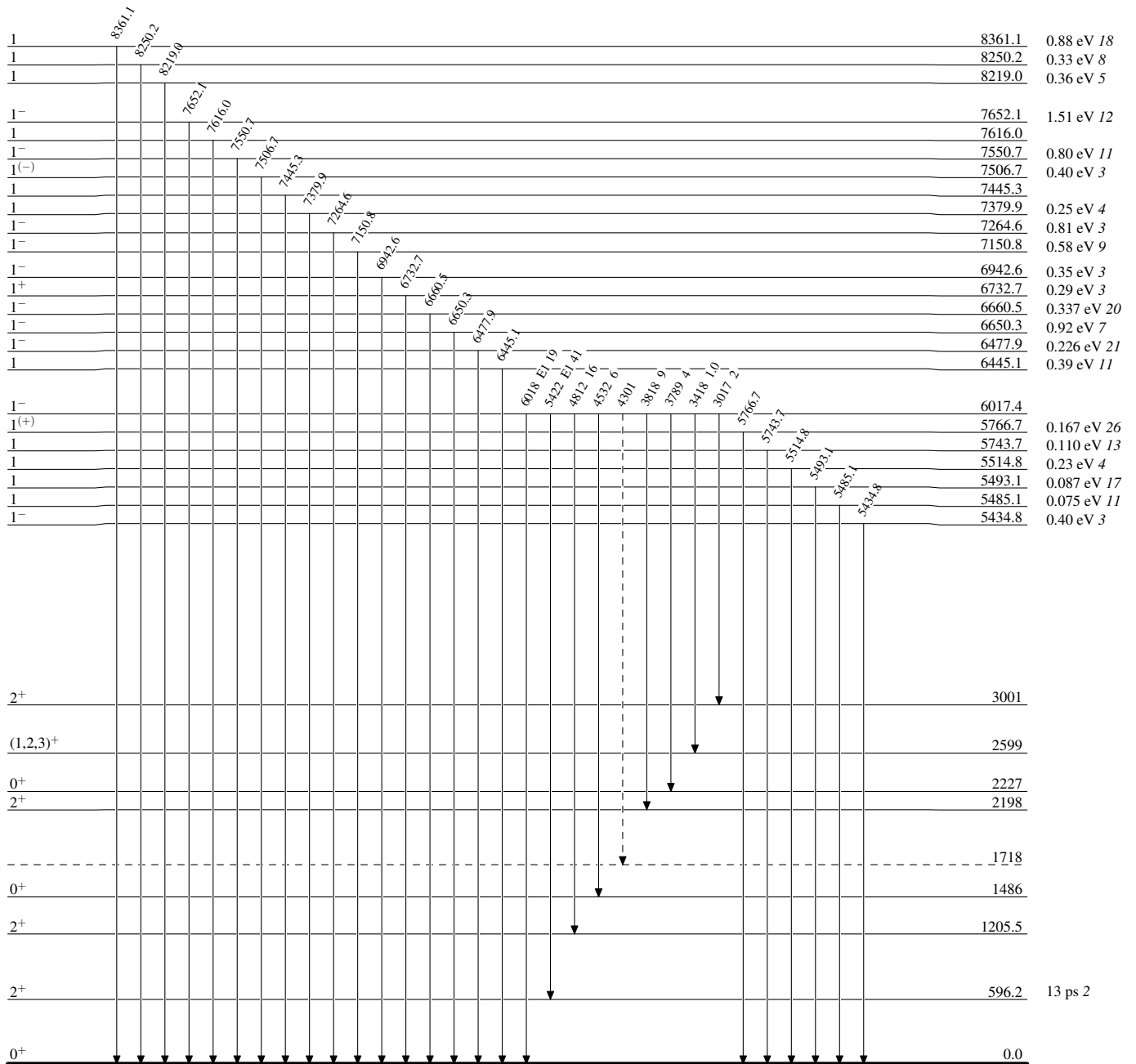
$^{74}\text{Ge}(\gamma,\gamma),(\text{pol } \gamma,\gamma)$  1995Ju01,1970Mo32

Legend

Level Scheme

Intensities: % photon branching from each level

-----▶  $\gamma$  Decay (Uncertain)



$^{74}_{32}\text{Ge}_{42}$

$^{74}\text{Ge}(\gamma,\gamma'),(\text{pol } \gamma,\gamma')$  1995Ju01,1970Mo32

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

-----▶  $\gamma$  Decay (Uncertain)

